

What is claimed is:

1. A hybrid switch, comprising:
 - a first switching module for switching voltages and currents and incurring switching losses;
 - a second switching module for conducting current and incurring conduction losses,
 - said first and second modules being connected electrically in parallel, and respectively controllable to be in one of an open non-conducting state and a closed conducting state, at least one said module having solid state construction.
2. The hybrid switch as in claim 1, wherein at least one of said modules includes a MOSFET.
3. The hybrid switch as in claim 1 wherein at least one of said first module and said second module is chosen from the group consisting of IGBTs, IGCTs, thyristors, and diodes.
4. The hybrid switch as in claim 1, further comprising a control circuit for switching said first module and said second module on and off in a predetermined sequence and for predetermined intervals.
5. The hybrid switch as in claim 1, wherein at least one of said first module and said second module is cryogenically cooled.
6. The hybrid switch as in claim 4, wherein said control circuit for switching said first module and said second module on and off is cryogenically cooled.
7. The hybrid switch as in claim 1, wherein at least two said second modules used for conducting currents are connected in parallel.
8. The hybrid switch as in claim 1, wherein at least two said second modules used for conducting currents are connected in series.
9. The hybrid switch as in claim 1 wherein at least two said first modules used for switching voltages and currents are connected in parallel.
10. The hybrid switch as in claim 1 wherein at least two said first modules used for switching voltages and currents are connected in series.

11. The hybrid switch as in claim 4, wherein said control circuit operates said modules to pass load current through said second module while bypassing said first module, to switch off said load current said control circuit turns said second module off to divert said load current to said first module and then turns said first module to the off state.

12. The hybrid switch as in claim 2, wherein at least one of said first module and said second module is cryogenically cooled.

13. The hybrid switch as in claim 2, further comprising a control circuit for switching said first module and said second module on and off in a predetermined sequence and for predetermined intervals.

14. The hybrid switch as in claim 13, wherein said control circuit operates said modules to pass load current through said second module while bypassing said first module, to switch off said load current said control circuit turns said second module off to divert said load current to said first module and then turns said first module to the off state.

15. The hybrid switch as in claim 14, wherein at least said second module is cryogenically cooled to reduce conduction losses.

16. The hybrid switch as in claim 5, further comprising a refrigeration unit cryogenically cooling said at least one module.

17. The hybrid switch as in claim 12, further comprising a refrigeration unit cryogenically cooling said at least one module.

18. The hybrid switch as in claim 16, wherein at least said second module is cryogenically cooled to reduce conduction losses.

19. The hybrid switch as in claim 14, wherein at least said first module is cryogenically cooled to reduce switching time.

20. The hybrid switch as in claim 16, wherein at least said first module is cryogenically cooled to reduce switching time.

21. The hybrid switch as in claim 7, wherein at least another two said second modules used for conducting currents are connected in series.